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pretty thoroughly mastered algebra, geometry, trigonometry, and the calculus, without a teacher, using as texts Bonnycastle, Hutton, Young, and Peirce. As a problem-solver, Mr. Harvey ranked high, as many of his solutions of difficult problems proposed in the various mathematical journals of the country will show. He has in his library some rare works on mathematics, all of which are offered for sale. Persons interested in securing rare mathematical works should write to Mrs. Harvey, Portland, Me.

Since the last issue of the MONTHLY one of its loyal friends and supporters has been removed from among the great body of American mathematicians. On July 8th, occurred the death of Professor John D. Runkle, Professor of Mathematics in the Massachusetts Institute of Technology. Professor Runkle was a substantial friend of the MONTHLY from the beginning, and we shall greatly miss him. In the last letter we received from him, among other things, he said, "Please find enclosed my check for $5 in payment of my subscription to the MONTHLY for the current year. I am glad to make this small voluntary contribution to help you in your difficult work, for I know, by experience, how hard it is to maintain the publication of a mathematical journal in this country. You are doing a good work." Professor Runkle's experience with mathematical journalism was with the *Mathematical Monthly* which was founded by him in 1858 and which he edited and published for three years, at the end of which time it was discontinued for lack of proper support. We hope in a future number to publish a biographical sketch of Professor Runkle.

BOOKS AND PERIODICALS.

The Foundations of Geometry. By David Hilbert, Ph. D., Professor of Mathematics, University of Göttingen. Authorized Translation by E. J. Townsend, Ph. D., University of Illinois. 8vo. Cloth, 132 pages. Price, $1.00 Chicago: The Open Court Publishing Co.

In this work Professor Hilbert attempts "to choose for geometry a *simple* and *complete* set of independent axioms and to deduce from these the most important geometrical theorems in such a manner as to bring out as clearly as possible the significance of the different groups of axioms and the scope of the conclusions to be derived from the individual axioms."

He begins by considering *three* systems of things which he calls *points*, *straight lines*, and *planes*, and sets up a system of axioms connecting these things in their mutual relations. The axioms he arranges in five groups. These are I. 1—7. Axioms of *connection*; II. 1—5. Axioms of *order*; III. Axioms of *parallels* (Euclid's axiom); IV. 1—6. Axioms of *congruence*; V. Axiom of *continuity* (Archimedes' axiom). He then discusses the relations of these axioms to one another and also the bearing of each upon the logical development of Euclidean Geometry. With these axioms, Professor Hilbert arrives at many important results. The dependence of some of Professor Hilbert's axioms on others has been referred to in a previous issue of the MONTHLY. The work is not only of great mathematical value, but it is also of great importance from the pedagogical standpoint to the teacher of mathematics. Every teacher of geometry should carefully study this book. B. F. F.

A Philosophical Essay on Probabilities. By Pierre Simon, Marquis de Laplace. Translated from the Sixth French Edition by Frederick Wilson Truscott, Ph. D., Professor of Germanic Languages in the West Virginia University, and Frederick Lincoln Emory, M. E., Professor of Mechanics and Applied Mathematics in the West Virginia University. 8vo. Cloth, iv+196 pages. Price, $2.00 New York: John Wiley & Sons.

In this essay are set forth in a very simple way and without the aid of analysis, the principles and general results of the theory of probability. As the principles of probability obtain in the most important problems of life, this book will be of interest to the student of the humanities as well as to the student of mathematics. This is certainly the most elementary exposition of the theory that has ever been written. The fact that Laplace is the great authority on the subject from the analytical point of view gives this essay double value. B. F. F.

An Introduction to Celestial Mechanics. By F. R. Moulton, Ph. D., Instructor in Astronomy in the University of Chicago. Large 8vo. Cloth, xv+384 pages. Price, $3.50. New York: The Macmillan Co.

The author says, in the preface, "the aim has been to prepare such a book that one who has had the necessary mathematical training may obtain from it in a relatively short time and by the easiest steps a sufficiently broad and just view of the whole subject to enable him to stop with much of real value in his possession, or to pursue to the best advantage any particular portion he may choose." This is certainly an ambitious aim, but we believe that the author has well accomplished his aim. The work begins with a treatment of simple mechanical principles and solutions of problems in which the principles are used. From these elementary considerations the student is *gradually* led to the consideration of the most difficult problems in Astronomy. Logical sequence of the various subjects and the relative prominence which their scientific and educational importance deserve, have been maintained throughout the book. Many problems have been solved to illustrate the various principles established. The Introduction to the Problem of Three Bodies is very explicit. The work most successfully bridges the gap between the somewhat Popular or Descriptive treatment of Astronomy on the one hand, and the Exhaustive Mathematical treatment on the other. The work is desined to do great good from both the mathematical and astronomical standpoint. Both the author and the publishers are to be congratulated on presenting this valuable work to the educational public. B. F. F.

Annals of Mathematics. Published Quarterly under the Auspices of Harvard University. Price, $2.00 per year.

No. 4, of Vol. 3 (July number) contains the following articles: Note on a Twisted Curve with an Involution of Pairs of Points in a Plane, by Prof. H. S. White; On Some Curves Connected with a System of Similar Conics, by Prof. R. E. Allardice; Note on Multiply Perfect Numbers, by Jacob Westlund; A Mechanical Construction of Confocal Conics, by Wm. R. Ransom; On Sophus Lie's Representation of Imaginaries in Plane Geometry, by Prof. Percy F. Smith; Note on the Group of Isomorphism of a Group of Order p^m, by Dr. G. A. Miller. B. F. F.

The American Journal of Mathematics. Published Quarterly under the Auspices of Johns Hopkins University. Price, $5.00 per year.

No. 3, Vol. XXIV, contains the following articles: Die Typen der linearen Complexe elliptische Curvenim R^r , Von S. Kantor; Generalization of the Differentiation Process, by Robert E. Moritz; Simple Pairs of Parallel W-Surfaces, by Henry D. Thompson. B. F. F.

Arithmetica Razionale ad Uso dei Ginnasi. Autore Roldolfo Bettazzi, Prof. Nella R. Accademia Militare e Nel R. Liceo Cavour. Prezzo, L. 2,00 Torino.